UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,543	02/27/2002	Rene Gallezot	FR920010006US1	7695

			EXAMINER
25299	7590	08/12/2004	TORRES, JOSEPH D

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ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2002*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

    4a) Of the above claim(s) *10,11 and 14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,12,13 and 15-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *10,11 and 14* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☒ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. *50040805* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1.   Restriction to one of the following inventions is required under 35 U.S.C. 121:

    I.   Claims 1-9, 12, 13 and 15-18, drawn to A Method for Performing Cyclic

          Redundancy Checks, classified in class 714, subclass 757.

    II.   Claims 10 and 14, drawn to A Method for Implementing a Divider Modulo

          2 for Forward Calculations, classified in class 708, subclass 492.

    III.   Claims 11 and 14, drawn to A Method for Implementing a Divider Modulo

          2 for Backward Calculations, classified in class 708, subclass 492.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are unrelated. Inventions are unrelated if it can be

shown that they are not disclosed as capable of use together and they have different

modes of operation, different functions, or different effects (MPEP § 806.04, MPEP §

808.01). In the instant case the different inventions are unrelated because in order to

carry out the invention of Group I the dividers must exist and be in place.

Inventions Group I and Group III are unrelated. Inventions are unrelated if it can be

shown that they are not disclosed as capable of use together and they have different

modes of operation, different functions, or different effects (MPEP § 806.04, MPEP §

808.01). In the instant case the different inventions are unrelated because in order to carry out the invention of Group I the dividers must exist and be in place.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Groups II and III and vice a versa, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Joscelyn Cogburn on 05 August 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-9, 12, 13 and15-18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10, 11 and 14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

2.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: '700' in Figure 7; '1100' in Figure 11; and '1330' & '1370' in Figure 13. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3.   The abstract of the disclosure is objected to because the Abstract exceeds 150

words. Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities:

-          Claim 1 recites, "displacing in said multiplicative cyclic group, a

           current value of said d-bit wide FCS, considered as one of said d-bit

           wide binary vectors, of a value corresponding to said N-bit at a time".

           Nowhere in the specification does the Applicant teach "displacing in

           said multiplicative cyclic group".

-          Claim 4 recites, "handling directly said new N-bit chunk of data bits as

           if it is said d-bit wide division result". Nowhere does the Applicant

           teach "handling directly said new N-bit chunk of data bits as if it is

           said d-bit wide division result".

Appropriate correction is required.

Claim Objections

4.   Claims 1-9, 12, 13 and 15-18 objected to because of the following informalities: they include reference numbers to the drawings that should be deleted. Appropriate correction is required.

Claims 12, 13 and 15 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependant claim such as claim 3. See MPEP § 608.01(n). **Accordingly, the claims 12, 13 and 15 have not been further treated on the merits.**

Claim 17 recites, "in act (d) being the calculated CRC". An act is not a calculated CRC.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5.   Claims 1-9, 12, 13 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in

the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 recites, "displacing in said multiplicative cyclic group, a current value of said d-bit wide FCS, considered as one of said d-bit wide binary vectors, of a value corresponding to said N-bit at a time". Nowhere in the specification does the Applicant teach "displacing in said multiplicative cyclic group".

Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 4 recites, "handling directly said new N-bit chunk of data bits as if it is said d-bit wide division result". Nowhere does the Applicant teach "handling directly said new N-bit chunk of data bits as if it is said d-bit wide division result".

Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 6 recites, "forward multiplication". Nowhere does the Applicant define "forward multiplication".

Claim 7 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the

enablement requirement. The claim(s) contains subject matter which was not described

in the specification in such a way as to enable one skilled in the art to which it pertains,

or with which it is most nearly connected, to make and/or use the invention. Claim 6

recites, "backward multiplication". Nowhere does the Applicant define "backward

multiplication".

Claims 16-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 recites, "displaying in a multiplicative cyclic group of values corresponding to N

a current value of d-bit wide FCS, considered as one of the d-bit wide binary vectors".

Nowhere in the specification does the Applicant teach "displaying in a multiplicative

cyclic group".

> The following is a quotation of the second paragraph of 35 U.S.C. 112:
>
> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

6.   Claims 1-9, 12, 13 and 15-18 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly claim the

subject matter which applicant regards as the invention.

Claim 1 recites, "displacing in said multiplicative cyclic group, a current value of said d-bit wide FCS, considered as one of said d-bit wide binary vectors, of a value corresponding to said N-bit at a time". The specification discloses that a multiplicative cyclic group is a set comprising d-bit wide vectors. The d-bit wide vectors are comprised of values. It is unclear and incomprehensible what displacing in a multiplicative cyclic group refers to (Note: displacement is not normally a group operation). It is unclear what "considered as one of said d-bit wide binary vectors" refers to.

Claims 1-9, 12, 13 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. Claim 1 recites, "a current value of said d-bit wide FCS". The omitted structural cooperative relationships are: the relationship between "a current value" and "said d-bit wide FCS".

Claim 1 recites, "resuming calculation loop at picking step; if not [1152], exiting calculation loop". There is insufficient antecedent basis for "calculation loop" to determine what comprises exiting the "calculation loop".

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission

amounting to a gap between the necessary structural connections. See MPEP

§ 2172.01. Claim 4 recites, "handling directly said new N-bit chunk of data bits as if it is

said d-bit wide division result". The omitted structural cooperative relationships are: the

relationship between "handling directly said new N-bit chunk of data bits" and "as if it is

said d-bit wide division result".

Claim 16 recites, "displaying in a multiplicative cyclic group of values corresponding to N

a current value of d-bit wide FCS, considered as one of the d-bit wide binary vectors".

The specification discloses that a multiplicative cyclic group is a set comprising d-bit

wide vectors. The d-bit wide vectors are comprised of values. It is unclear and

incomprehensible what displaying in a multiplicative cyclic group refers to (Note:

displaying is not normally a group operation). It is unclear what "considered as one of

said d-bit wide binary vectors" refers to.

Claims 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete

for omitting essential structural cooperative relationships of elements, such omission

amounting to a gap between the necessary structural connections. See MPEP

§ 2172.01. Claim 16 recites, "a current value of said d-bit wide FCS". The omitted

structural cooperative relationships are: the relationship between "a current value" and

"said d-bit wide FCS".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

7.   Claims 1-4, 6, 8, 9 and 16-18 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Cassiday; Daniel R. et al. (US 6684363 B1, hereafter referred to as

Cassiday) in view of Wicker (Stephen B. Wicker, Error Control systems for Digital

Communication Storage, Prentice-Hall, 1995, pages 116-121).

35 U.S.C. 103(a) rejection of claims 1 and 16-18.

Cassiday teaches picking a new N-bit chunk of data bits from said binary string of data

bits (CRC generator 304 in Figure 3 of Cassiday receives a new N-bit chunk of data bits

from said binary string of data bits); updating said d-bit wide FCS (the CRC from 308 is

updated); checking if more data bits of said binary string of data bits are left for: if yes

resuming calculation loop at picking step; if not, exiting calculation loop; thereby, getting

a final result of said CRC calculation in said d-bit wide FCS calculation (Figure 4A in

Cassiday teaches that the payload for a string of data is applied to CRC generator 304

in Figure 3 until all of the payload bits are used up).

However Cassiday does not explicitly teach the specific use of dividing modulo said

generator polynomial G(x), said new N-bit chunk of data bits thus, getting a d-bit wide

division result.

Wicker, in an analogous art, teaches the use of division by a generator polynomial to

create CRC checks (Note: division is a common means for generating CRC).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the teachings of Cassiday by including use of dividing

modulo said generator polynomial G(x), said new N-bit chunk of data bits thus, getting a

d-bit wide division result. This modification would have been obvious to one of ordinary

skill in the art, at the time the invention was made, because one of ordinary skill in the

art would have recognized that use of dividing modulo said generator polynomial G(x),

said new N-bit chunk of data bits thus, getting a d-bit wide division result would have

provided the opportunity to implement the CRC calculator taught in the Cassiday patent.

35 U.S.C. 103(a) rejection of claim 2.

Cassiday teaches a final result is provided to Encoder 312 in Figure 3 of Cassiday.

35 U.S.C. 103(a) rejection of claim 3.

Step 414 in Cassiday teaches said final result is a checking result of said binary string of data bits including said d-bit wide FCS.

35 U.S.C. 103(a) rejection of claim 4.

Block 504 in Cassiday teaches handling directly said new N-bit chunk of data bits as if it is said d-bit wide division result.

35 U.S.C. 103(a) rejection of claim 6.

Figure 6 on page 116 of Freeman teaches division for CRC corresponds to polynomial multiplication.

35 U.S.C. 103(a) rejection of claims 8 and 9.

Claims 8 and 9 recite intended use claims and the teaching in Cassiday and Wicker are inherently capable of being used in a networking environment or a computing system. In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997)

8.   Claims 5 rejected under 35 U.S.C. 103(a) as being unpatentable over Cassiday; Daniel R. et al. (US 6684363 B1, hereafter referred to as Cassiday) and Wicker (Stephen B. Wicker, Error Control systems for Digital Communication Storage, Prentice-Hall, 1995, pages 116-121) in view of Freeman; Richard B. et al. (US 3678469 A, hereafter referred to as Freeman).

35 U.S.C. 103(a) rejection of claim 5.

Cassiday and Wicker substantially teaches the claimed invention described in claims 1-4 (as rejected above).

However Cassiday and Wicker do not explicitly teach the specific use of padding.

Freeman, in an analogous art, teaches padding (see New Character 34 in Figure 2a).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Cassiday and Wicker with the teachings of Freeman by including use of padding. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of padding would have provided the opportunity to use the CRC encoder for variable length data.

9.   Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cassiday; Daniel R. et al. (US 6684363 B1, hereafter referred to as Cassiday) and Wicker (Stephen B. Wicker, Error Control systems for Digital Communication Storage, Prentice-Hall, 1995, pages 116-121) in view of Kanasugi; Masami et al. (US 6493844 B1A, hereafter referred to as Kanasugi).

35 U.S.C. 103(a) rejection of claim 7.

Cassiday and Wicker substantially teach the claimed invention described in claims 1-4 (as rejected above).

However Cassiday and Wicker do not explicitly teach the specific use of backward multiplication.

Kanasugi, in an analogous art, teaches backward multiplication (Figure 8 and 9 in Kanasugi are LFSR circuits for doing polynomial multiplication in the forward and backward directions).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Cassiday and Wicker with the teachings of Kanasugi by including use of backward multiplication. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of backward multiplication would have provided the opportunity to receive and decode strings in the reverse direction.
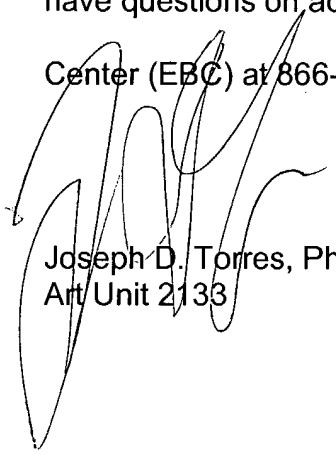

Conclusion

10.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (703) 308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

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